## REMARKS

Claims 1-14 and 17-22 were pending in this application. In response to the Office Action dated September 9, 2003, claims 1, 3, 11, 13 and 21 have been amended and claims 2, 4, 6, 8, 10, 12, 14, 18 and 22 have been canceled. Care has been exercised to avoid the introduction of new matter. Indeed, adequate descriptive support for the present Amendment is apparent throughout the originally filed claims and disclosure, including Figure 5, Example 4 in Table. Applicants submit that the present Amendment does not generate any new matter issue.

Initially, Applicants respectfully request the Examiner to acknowledge receipt of the Information Disclosure Statement (IDS) filed January 23, 2004, and forward Applicants an appropriately initialed copy of form PTO-1449 indicating consideration of the cited prior art.

In the final Office action dated September 9, 2003, claims 11-14 were objected to under 37 CFR 1.75(c), as allegedly being of improper dependent form for failing to further limit the subject matter of a previous claim. Specifically, the Examiner stated that claims 11-14 broaden the scope of claims 3 and 4 and suggested recasting these claims in independent form. Claims 11 and 13 have been recast in independent form and claims 12 and 14 have been canceled. Accordingly, the Examiner is requested to reconsider and withdraw the objection over claims 11 and 13.

Claims 11-14, 17 and 18 were rejected under 35 U.S.C. § 112, second paragraph. Applicants respectfully traverse the rejection in view of the arguments and amendments. Moreover, claims 12, 14 and 18 have been canceled and, therefore, the rejection is moot with respect to these claims.

The Examiner asserted that it is unclear what the formulas of claims 3 and 4 encompass if the composition of x is "within ± 5%" according to claims 11-14. As noted above, claim 11 has been recast in independent form and no longer depends from claim 3. Accordingly, Applicants submit that the rejection is moot.

The Examiner asserted that claims 17 and 18 were incomplete for allegedly omitting essential elements. Specifically, the Examiner stated that claims 17 and 18 do not define elements e or f and, further asserted that if z is a substitution quantity of M' then the general formula should be amended accordingly. Applicants traverse.

Applicants stress that the Examiner has failed to offer any reasoning as to why one having ordinary skill in the art would have had difficulty understanding Applicants' claimed invention. For this reason alone the rejection is not viable. Moreover, claim 17 recites that element e or f is a natural number ranging from 1 to 30, with e < f. Thus, the claims clearly define these elements and one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably interpreted in light of the supporting specification. Further, with respect to z, as discussed at page 11 of the specification, a part of the substitution metal M' can be substituted for one of the typical metal element or the transition metal element excluding Mn, Cr and Co, or for a metal M" in accordance with any combination of the above-described metal elements. In this case, the formula (C) can also be represented by the following formula $Li_{1-x}Mn_{1-y}M'_{y(1-Z)}M''_{yz}O_{2-\delta}$, wherein z is a M'-substitution quantity, and is preferably a rational number. When z is represented as e/f, desirably, e and f are natural numbers ranging from 1 to 30 and also satisfy e < f. Applicants submit, therefore, that one having ordinary skill in the art would not have difficulty understanding the scope of the presently claimed invention, particularly when reasonably

interpreted in light of the supporting specification. The Examiner provided no arguments to justify why one having ordinary skill in the art would have had difficulty understanding Applicants' claimed invention. Therefore, it is respectfully submitted that the imposed rejection of claim 17 under 35 U.S.C. § 112, second paragraph is not legally viable and hence, solicit withdrawal thereof.

Claims 1-14, 19-22 were rejected under 35 U.S.C. § 102(e) as being anticipated over Dahn et al. (U.S. Pat. No. 6,168,887, hereinafter "Dahn"). Applicants respectfully traverse the rejection for the reasons set forth *infra*.

In the Advisory action dated February 9, 2004, the Examiner asserted that Dahn discloses x in the range of $0 < x < 0.5$. The Examiner further stated that Dahn teaches the same layered lithium manganese compound as disclosed in the claimed invention and, therefore, the Dahn's layered lithium manganese oxide would inherently possess the same bond overlap population (BOP) value (more than or equal to 0.23) as the claimed invention. Applicants respectfully traverse.

It is well settled that inherency requires certainty, not speculation. *Electro Medical Systems S.A. v. Cooper Life Sciences, Inc., 34 F.3d 1048, 32 USPQ2d 1017 (Fed. Cir. 1994); Continental Can Co. USA, Inc. v. Monsanto Co., 948 F.2d 1264, 20 USPQ2d 1746 (Fed. Cir. 1991); In re Oelrich, 666 F.2d 578, 212 USPQ 323 (CCPA 1981).* Accordingly, when invoking the doctrine of inherency, the Examiner is obliged to point to a bases in fact and/or cogent technical reasoning to support the factual determination that the allegedly inherent feature necessarily flows from the teachings of the applied prior art. *Finnegan Corp. v. ITC, 180 F.3d 1354, 51 USPQ2d 1001 (Fed. Cir. 1999); In re Robertson, 169 F.3d 743, 49 USPQ2d 1949*

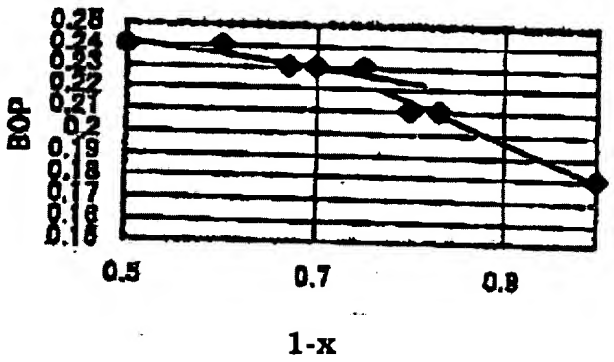
*(Fed. Cir. 1999).* It is respectfully submitted that this burden has not been discharged for the reasons set forth below.

Independent claims 1, 11, 13 and 21 each recite, in pertinent part, that the lithium deficient quantity x satisfies the following expression: $1/5 < x < 2/5$. Moreover, independent claims 1, 11, 13 and 21, each recites in pertinent part, that the positive electrode active material includes the layered lithium manganese compound having a bond overlap population (BOP) value that is more than or equal to 0.23. Applicants submit that Dahn fails to disclose the minimum and maximum values of x as recited in the independent claims.

Dahn neither teaches nor suggests a BOP value or $0.2 < x < 0.4$. A range of -0.4 to 0.5 is not consistent with a range of more than 0.2, but less than 0.4. Dahn discloses $-0.3 < x < 0.5$ (i.e. $0.5 < 1-x < 1.3$), however, the present inventors have discovered that a value of BOP is more than 0.23 even if x is more than 0.5 (i.e. $1-x < 0.5$). For instance, when x is more than 0.5, a lithium-deficient quantity is larger than a lithium-deficient quantity recited in the present claims and, therefore, a bonding power between metal elements and oxygen elements is strong as compared with the claimed invention. As a result, it is believed that a BOP becomes higher when x is more than 0.5. The Examiner's attention is directed to Figure 1 of the present specification, wherein the layered lithium manganese compound is formed of a repeating structure comprised of a metal layer, such as a Mn layer, an oxygen layer, a Li layer and another oxygen layer. A BOP is an index for an evaluation of a bonding strength between the Li layer and oxygen layers, which are placed above and below the Li layer, respectively. When the lithium-deficient quantity becomes larger, an amount of electrons the Li layer and oxygen layer hold in common is reduced and an amount of electrons that the metal layer and oxygen layer hold in common is increased. Accordingly, the bonding strength between metal layers and

oxygen layers is improved and, therefore, the value of BOP increases. Therefore, even if x is more that 0.5 (i.e. 1-x < 0.5), a value of BOP satisfies the conditions of BOP > 0.23. In contrast, the layered lithium manganese compound of Dahn that satisfies the range of -0.3 < x < 0.5 (i.e. 0.5 <1-x < 1.3) is not consistent with a layered lithium manganese compound that satisfies the range of BOP > 0.23.

Moreover, the following graph is presented which illustrates a relationship between BOP and "1-x" values based on the table of Figure 5 of the present invention.




As described in the table of Figure 5 and illustrated in the graph above, when x increases, a value of BOP is changed around where BOP is 0.23 or "1-x" is 0.8 (i.e. x = 0.2). When BOP is more than 0.23 or "1-x" is less than 0.8 (i.e. x < 0.2), the changing rate of BOP is small. In other words, a crystal structure is stable when BOP is more than 0.23 or "1-x" is less than 0.8 (i.e. x < 0.2). Dahn does not teach or suggest the critical point of BOP or the minimum and maximum values of x. Therefore, Dahn does not inherently disclose the claimed BOP value and as such, fails to identically disclose each element of the claimed invention.

Further, as is discussed at page 8, lines 8-19 of the specification, if a BOP value is high, it can be determined that the change in the crystal structure due to a thermal history is small, that is, the stability of the layered lithium manganese compound of the Li deficient type is high. For

example, when the Li-deficient quantity x is larger than 1/5 (as in claims 1 and 21), a high BOP value can be obtained and the structure stability due to the Li deficiency can be secured. When the Li-deficient quantity x is larger than 1/2, the Li-containing quantity in the molecular crystal becomes undesirably smaller than that of the prior art's spinel type $LiMn_2O_4$. See specification at page 9, lines 5-27. Moreover, the Examiner's attention is directed to the comparative data of the present specification, depicted at Figures 5-7 and 10, which clearly supports the claimed relationship between the BOP value and the Li-deficiency. In contrast with the present invention, Dahn fails to disclose or remotely suggest the claimed BOP value. Therefore, the references fail to disclose every limitation of the present claims. Thus, the rejection is not valid and should be withdrawn for at least these reasons.

Claims 17-18 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Dahn et al. (U.S. Pat. No. 6,168,887). Claim 18 has been canceled and, therefore, the rejection is moot with respect to this claim. Applicants respectfully traverse the rejection of claim 17 for substantially the same reasons as outlined above since Dahn does not disclose or remotely suggest every limitation of the independent claims. Accordingly, dependent claim 17 is patentably distinct in view of its dependency from independent claim 21.

It is believed that all pending claims are now in condition for allowance. Applicants therefore respectfully request an early and favorable reconsideration and allowance of this application. If there are any outstanding issues which might be resolved by an interview or an Examiner's amendment, the Examiner is invited to call Applicants' representative at the telephone number shown below.

To the extent necessary, a petition for an extension of time under 37 C.F.R. 1.136 is hereby made. Please charge any shortage in fees due in connection with the filing of this paper, including extension of time fees, to Deposit Account 500417 and please credit any excess fees to such deposit account.

Respectfully submitted,

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